

AMIETE – ET (OLD SCHEME)

Time: 3 Hours

JUNE 2012

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

- a. Recovering information from a carrier is known as

(A) demultiplexing	(B) modulation
(C) demodulation	(D) carrier recovery
- b. Single sideband system require

(A) more band width	(B) high power
(C) more modulation index	(D) Complex Receiver Circuit
- c. In a DM system, the granular noise occurs when the modulating signal

(A) increases rapidly	(B) remains constant
(C) decreases rapidly	(D) the nature of modulating signal has no effect on noise
- d. A zero source generates two messages with prob 0.8 and 0.2 These are coded as 1 and 0. The code efficiency is

(A) 0.2	(B) 0.5
(C) 0.7	(D) 1.0
- e. 13 dBm is equivalent to

(A) 2 mW	(B) 20 W
(C) 20 mW	(D) 2 W
- f. For uniform quantization with 32 levels, the quantized output can be represented by a binary digits where n is

(A) 5	(B) 8
(C) 6	(D) 4
- g. In forward error correction, if the data unit is 111111 and the divisor is 1010, then the dividend at the transmitter is

(A) 1111111000	(B) 1111111010
(C) 111111	(D) 1111110000

Code: AE15**Subject: COMMUNICATION ENGINEERING**

- h. Hamming code has a capability of
- (A) Error detection (B) Error correction
(C) Error detection and correction (D) Error encapsulation
- i. The probability density function of the envelope of narrowband noise is
- (A) Poisson (B) Gaussian
(C) Rayleigh (D) Rician
- j. The Ring Modulator is used for the generation of
- (A) SSB-SC signal (B) DSB-SC signal
(C) FM signal (D) AM signal

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

- Q 2.** a. Differentiate between analog and digital signals. (4)
- b. Draw and explain block diagram of a communication system. (6)
- c. Find the mathematical representation of narrow band noise. (6)
- Q 3.** a. Explain the different types of internal noise in brief. (8)
- b. Derive the expression for Noise in a two stage cascaded amplifier. (8)
- Q 4.** a. Define modulation index with respect to amplitude modulation. Derive the power relation and efficiency in A.M. modulated wave. (10)
- b. Drive the mathematic expression for double sideband suppressed carrier. (DSB-SC) (6)
- Q5.** a. What will happen if a PM signal is received by an FM receiver and vice versa? Also describe the narrowband frequency modulation. (8)
- b. If a sinusoidal message signal is modulated with modulation index of 0.4 and 0.5, then
- (i) Find the efficiency of AM signal.
- (ii) When 100% modulation is achieved. (8)
- Q6.** a. State and prove the sampling theorem for the low pass signals. (8)
- b. Explain the principle of Adaptive delta modulation. How does it differ from delta modulation? (8)
- Q7.** a. Describe the Hamming code, Hamming distance and Entropy. (8)

Code: AE15**Subject: COMMUNICATION ENGINEERING**

- b. A DMS X has five symbols x_1, x_2, x_3, x_4 and x_5 with $P(x_1) = 0.4$
 $P(x_2) = 0.19$, $P(x_3) = 0.16$, $P(x_4) = 0.15$ and $P(x_5) = 0.1$
Construct the Shannon-Fano code for X and calculate the efficiency of code. **(8)**
- Q8.** a. Describe the operation of a CW Doppler radar can we use a CW radar for range measurement? Discuss. **(8)**
- b. Explain the importance of Blanking and synchronizing pulse in T.V transmission. **(8)**
- Q9.** Write short notes on
- (i) Pulse Amplitude Modulation (PAM)
 - (ii) Optimum Receiver
 - (iii) SNR of PCM
 - (iv) Channel capacity of a Gaussian channel **(4×4)**